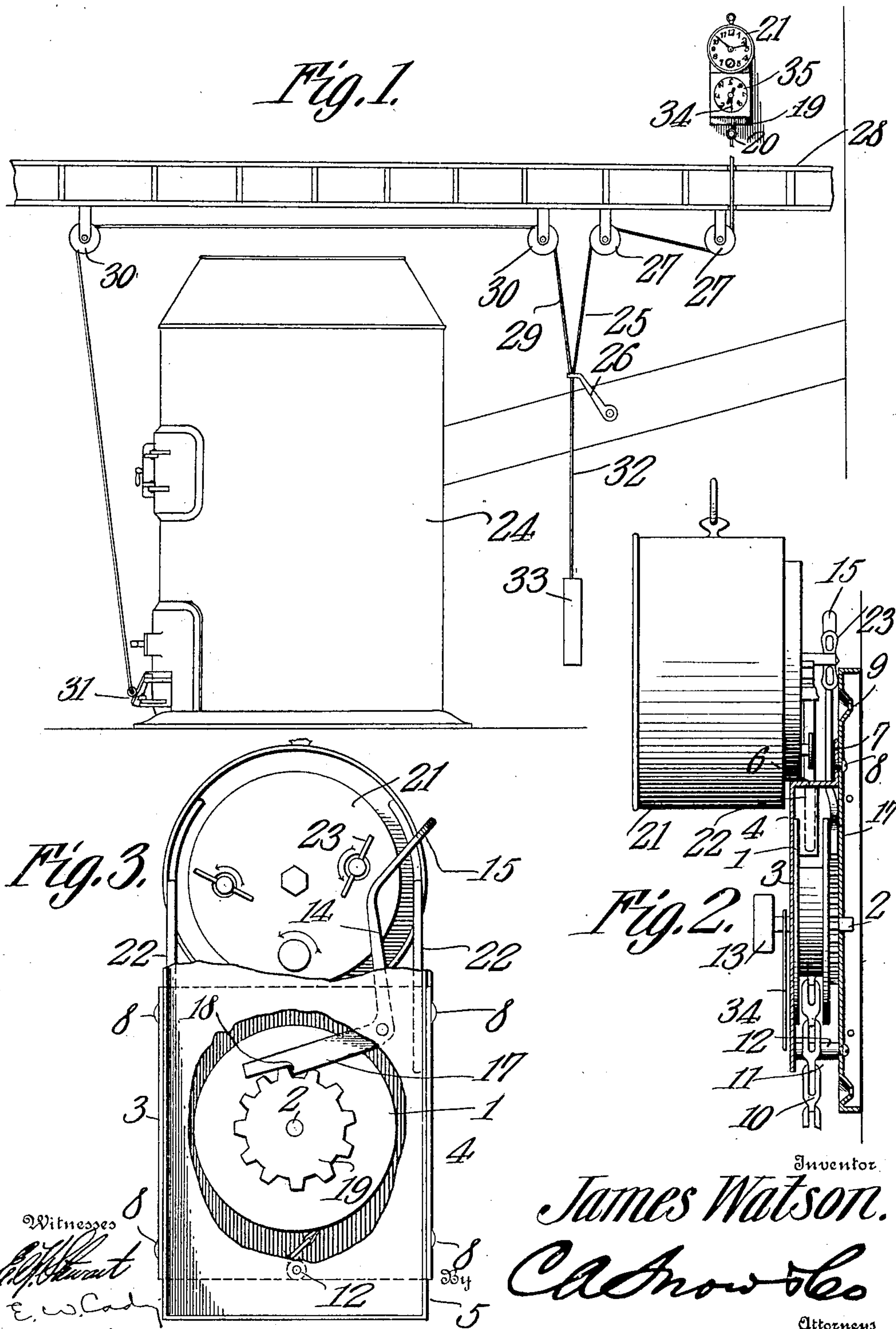


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FURNACE REGULATOR.  
APPLICATION FILED MAY 7, 1908.

906,590.

Patented Dec. 15, 1908.





# UNITED STATES PATENT OFFICE.

JAMES WATSON, OF MARINETTE, WISCONSIN.

## FURNACE-REGULATOR.

No. 906,590.

Specification of Letters Patent.

Patented Dec. 15, 1908.

Application filed May 7, 1908. Serial No. 431,461.

*To all whom it may concern:*

Be it known that I, JAMES WATSON, a citizen of the United States, residing at Marinette, in the county of Marinette and State of Wisconsin, have invented a new and useful Furnace-Regulator, of which the following is a specification.

This invention relates to devices for automatically setting a machine in motion, or for automatically regulating steam pressure, and has especial reference to devices for automatically regulating the draft of furnaces, in which the controlling devices of heating apparatus are held in fixed position for a predetermined period of time, and which at the end of that period will be automatically operated for varying the heat of the furnace.

The invention consists of an improved automatic regulator of this character, as hereinafter set forth and claimed.

Referring to the drawings, Figure 1 is a view of a furnace, and an automatic regulator, constructed in accordance with this invention, connected with the furnace door, and damper controlling mechanism. Fig. 2 is a side view in elevation of the invention, and an alarm clock. Fig. 3 is a rear view of the apparatus shown in Fig. 2, with part of the casing broken away.

As shown in detail in Figs. 2 and 3, the automatic regulator consists of a flanged drum 1 mounted on a shaft 2 having its bearings in the front and rear sides of a metallic casing 3. The casing 3 is formed in two parts 4 and 5, the part 4 being a rectangular piece of metal formed with a front, sides, and a top portion 6 with a flange 7, and the part 5 consisting of a back plate detachably secured to the part 4 by screws 8 engaging the sides of part 4, and the flange 7. The back plate 5 extends above and below the part 4 and is provided with perforations 9 for nails or screws by means of which the casing 3 may be mounted on a wall or other support, as shown in Fig. 1.

Connected to the drum 1 is a chain 10 which extends down through the opening 11 in the bottom of the casing 3, and over a roller 12 mounted in the parts 4 and 5, by means of which it extends in a central direction from the bottom of casing 3. The drum 1 is operated by a suitable handle 13. Mounted on a stud carried by the casing 3 is a lever 14 having an arm 15 projecting through an opening in the top portion 6 of the casing. The lever 14 is provided with

a weighted short arm portion 17 having a shoulder 18 normally held by gravity in engagement with the ratchet wheel 19 mounted on the shaft 6 adjacent to drum 1. When the chain 10 is wound up on the drum 1, the lever 14 will be held in engagement with the ratchet wheel 19 by gravity, as shown in Fig. 3. The end of the chain 10 is provided with a ring 20, or other suitable means, for connecting it with the controlling mechanism to be operated. The lever 14 may be released by any suitable means, and, as here shown, is employed in conjunction with an alarm clock 21, which may be detachably mounted on the casing 3 by means of holes in the top 6, in which arms 22 on the clock 21 are inserted. The inclined portion 15 of the lever 14 is located adjacent to the winding handle 23 of the alarm mechanism of clock 21, so that, when the alarm goes off, the handle 23 will strike against the inclined portion 15 of lever 14, and throw the latter out of engagement with the ratchet wheel 19, thereby releasing the drum 1 and permitting it to revolve, and the chain 10 to be unwound therefrom.

As shown in Fig. 1, the regulator is employed in connection with the draft door and flue damper controlling mechanism of a furnace 24, which consists of a cord 25 connected at one end to the flue damper lever 26 and passing over pulleys 27 mounted underneath the floor 28 at the top of a cellar extends up through the floor and is connected to the ring 20. A cord 29 has one end connected to the flue damper lever 26, (the damper being closed) and passing over pulleys 30 mounted beneath the floor 28 extends down to and is connected with the closed furnace draft door 31. Suspended from the damper lever 26 by a cord 32 is a weight 33, which is held up through the cord 25 connected with chain 19, wound on the drum 1 held in locked position by the lever 14. At the predetermined time, when the alarm mechanism is released, the handle 23, striking the portion 16 of lever 14, trips the latter out of engagement with the ratchet wheel 19, and releasing the drum 1, permits it to revolve the chain 10 to unwind and the weight 33 to drop. The dropping of the weight 33 pulls down the damper lever 26 and opens the flue damper, and at the same time pulls the cord 29, thereby opening the draft door 31.

When it is desired to reset the apparatus,



it is only necessary to wind up chain 10 on drum 1 by means of the handle 13, the weighted arm 17 of lever 14 riding over the teeth of ratchet wheel 19 until the chain is sufficiently wound up, when the arm 18 automatically engages the ratchet wheel 19 and locks the drum 1 in position. To avoid overwinding the chain 10 on the drum, a pointer or hand 34 is mounted on the shaft 2 and held thereon in frictional engagement, and a numbered dial 35 is arranged on the casing 3. By means of this device, when the drum 1 rotates, and the chain 10 runs out, the hand 34 will be carried around on the dial and stop at a certain number, when the chain has run out and the drum stops, so that this number indicates the point at which the proper amount of chain has been wound up. Upon the next winding the hand 34, having been moved back to zero, will be carried around to the aforesaid number, and indicates the point at which to stop winding. In lieu of the alarm mechanism, a spring may be used revolving the winding key that contacts with lever 14, and obviating the noise of the alarm.

When the regulator is attached to a steam plant, a connection will be made to the lever of the diaphragm, so that, when the steam reaches the desired pressure, it will lift the weight that hangs from the damper lever and will close the front draft, and, if pressure still increases, will close the damper in pipe also, regulating the steam to an even pressure. The regulator can also be applied

in turning on or off electric lights, or self-lighting gas. If so desired, the regulator may be operated by hand without the clock attachment. The winding of the chain upon the flanged drum permits long leverage on the parts to be operated where long levers are used with dampers. By means of the drum and lever a damper can be adjusted and held in any position if the chain be connected directly to the damper.

Having described the invention, I claim:—

In an automatic regulator of the character described, the combination with an alarm clock of a casing with an opening in its top and bottom; a drum with a shaft projecting from one side of the casing; a chain adapted to be wound on the drum, and extending through the bottom of the casing; a ratchet wheel mounted on the drum shaft; a counterbalanced lever normally held by gravity in locked engagement with said ratchet wheel, and projecting up through the casing in the path of movement of the winding handle of the alarm mechanism; a numbered dial on the front of the casing; a hand adjustably mounted on the drum shaft and movable over the dial; and a winding handle on the drum shaft.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JAMES WATSON.

Witnesses:

ELLIS PETERSON,  
O. G. PINKOWSKY.